

Travel Time Information

ITS Seminar 2017

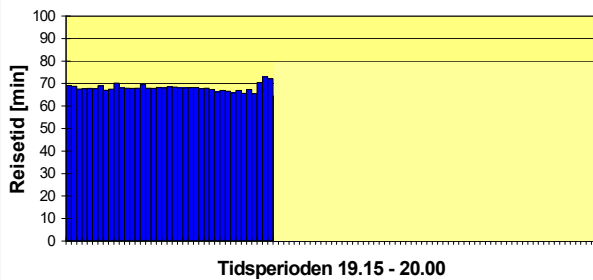
Torbjørn Haugen

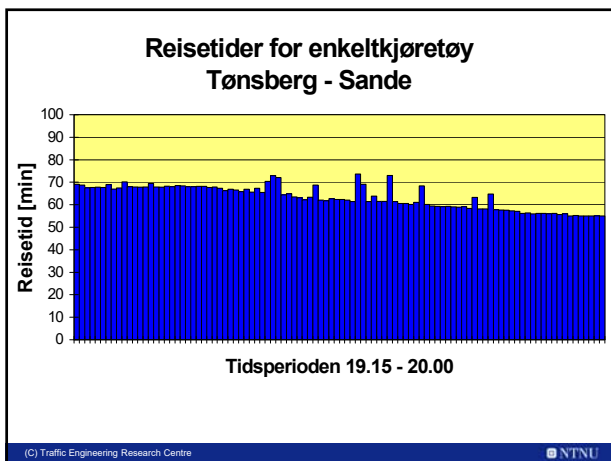
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Why Travel Time?

- Traffic Information
- Before – After studies
- Traffic analysis
- Performance Index

Reisetider for enkeltkjøretøy Tønsberg - Sande





Average Travel Time

Vehicle	Time A	Time B
1	15.03.00	15.09.00
2	15.04.10	15.09.10
3	15.04.50	15.11.30
4	15.05.30	15.09.50
5	15.06.30	15.10.40

Average Travel Time 15.05-15.10 ?

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- ### The Travel Time System
- Technology
 - Filtering Algorithms
 - Travel time aggregation and calculation
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Travel Time – Definitions

- Registration
- Estimation
- Prediction

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Road sections

- Main roads in and around some large cities
- Main road between cities in Eastern Norway



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OBU and Antennas



- One antenna in each direction

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Travel Time - Stavanger



Green	Delay < 20%
Yellow	Delay between 20 and 50%
Red	Delay > 50%

www.reisetider.no

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VMS



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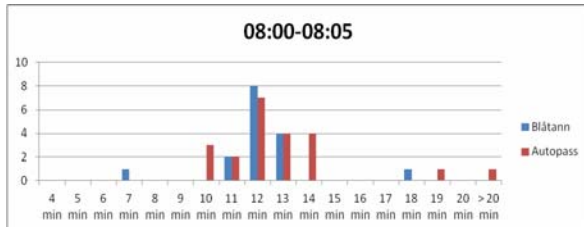


Test site / Equipment



Test Trondheim – Bluetooth vs AutoPASS

Number of travel times

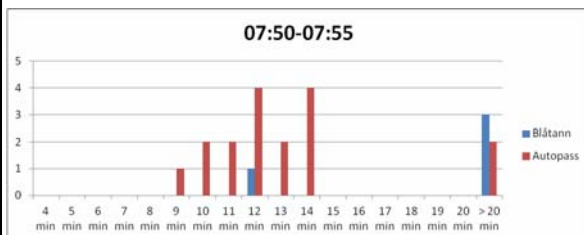


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Test Trondheim – Bluetooth vs AutoPASS

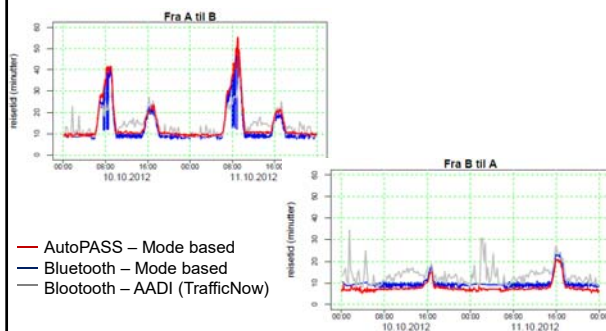
Number of travel times



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Test Bluetooth Oslo 2012 - Travel Time



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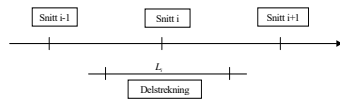
Test Navigation System Oslo 2015 - Travel Time



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Estimation



$$L_i = \frac{1}{2}(L_{i,i} + L_{i,i+1})$$

- L_i = Length of subsection i
- $L_{i,i}$ = Length of subsection between snitt $i-1$ and snitt i
- $L_{i,i+1}$ = Length of subsection between snitt i and snitt $i+1$

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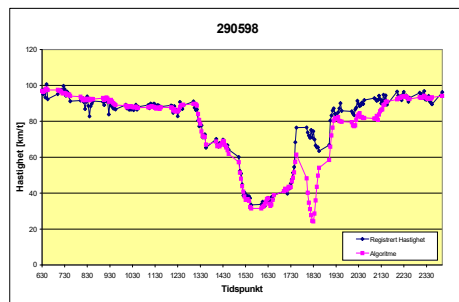
Speed Definitions

- Average Point Speed $\bar{u}_p = \frac{\sum u_{pi}}{n}$
 - Average Section Speed $\bar{u}_s = \frac{1}{n} \sum \frac{1}{u_{si}}$ $\bar{u}_s = \frac{d}{\frac{1}{n} \sum t_i}$
- $$t_i = \frac{d}{u_{si}}$$
- $$\bar{u}_p = \bar{u}_s + \frac{\sigma_{BS}^2}{u_s^2}$$

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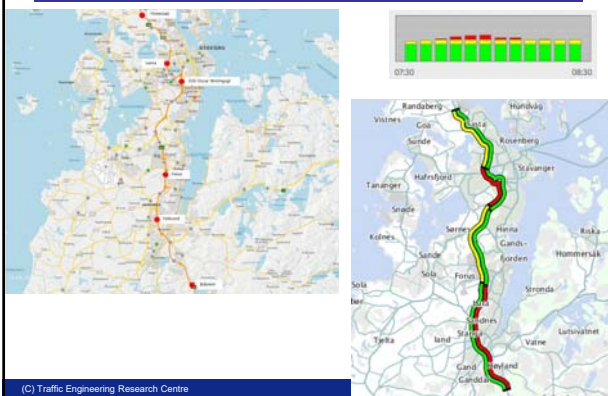
Travel time Estimation



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Travel Time Prediction - Stavanger



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Bicycle Travel Time

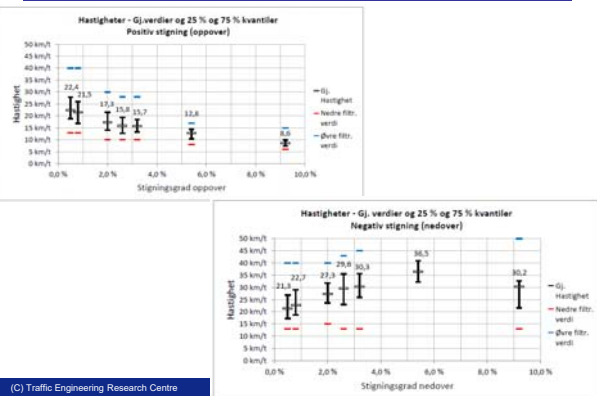
- Bluetooth and WiFi
- Test of technology and correlation between geometry and speed



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Bicycle Travel Time



Some Master Thesis

- 1994 Sturød Are Trafikkstyring på E18 i Vestfold
- 1997 Nyheim Stine Prognosemodell for utvikling av forsinkelse
- 2007 Undheim Ingve Trafikkavvikling på E39
- 2009 Moen Helen Tilfartskontroll på E39
- 2011 Aakre Erlend Evaluering av kvaliteten på trafikkdata
- 2013 Aune Silje R. Reisetid med Blåtann
- 2014 Grønlund H og Overå S Reisetider for sykkel - Blåtann og WiFi
- 2015 Lunde E og Wolff T Travel time prediction
- 2016 Maximilian Böhm Digital based pedestrian counting

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Some Other Projects

- Gjennomkjøringsandeler - Bymiljøavtaler
- Reisetid for ulike kjøretøytyper – NTP – Fremkommelighetsindikatorer
- Klimagass strategi – Bymiljøavtaler og NTP

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Questions ?

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